J. H. CARY.

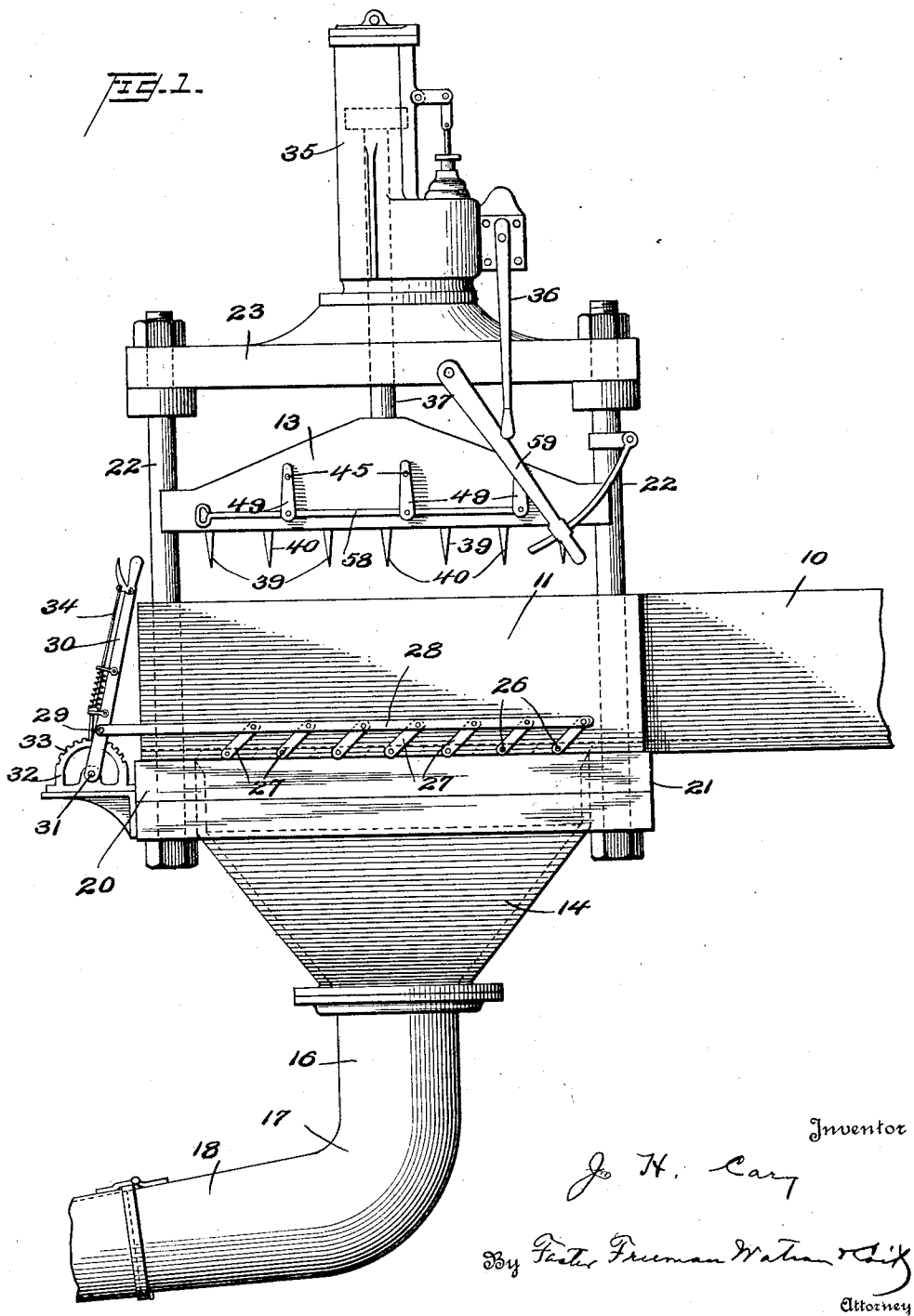
ICE CRUSHING AND CONVEYING MECHANISM.

APPLICATION FILED NOV. 8, 1919.

1,386,315. Patented Aug. 2, 1921.

3 SHEETS—SHEET 1.

FIG. 1.



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3 SHEETS—SHEET 2.

FIG. 3.

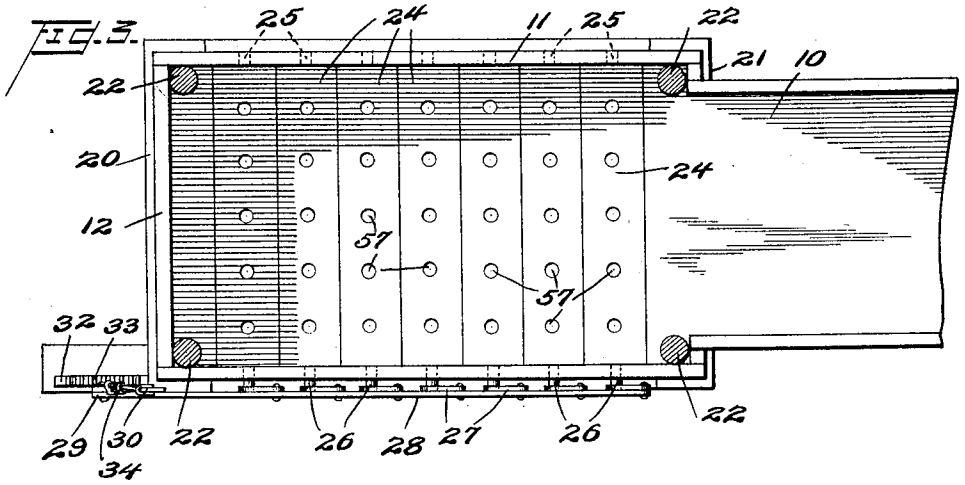


FIG. 4.

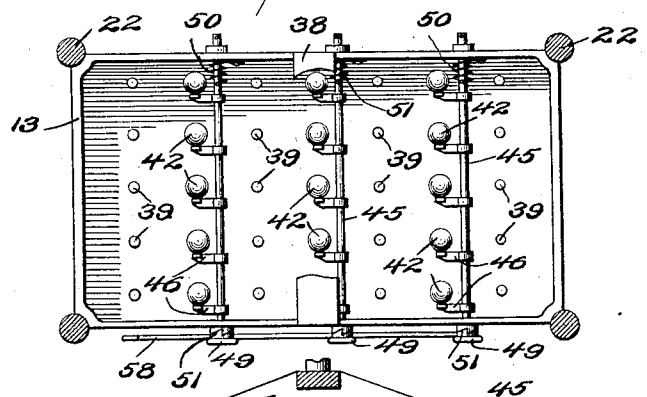
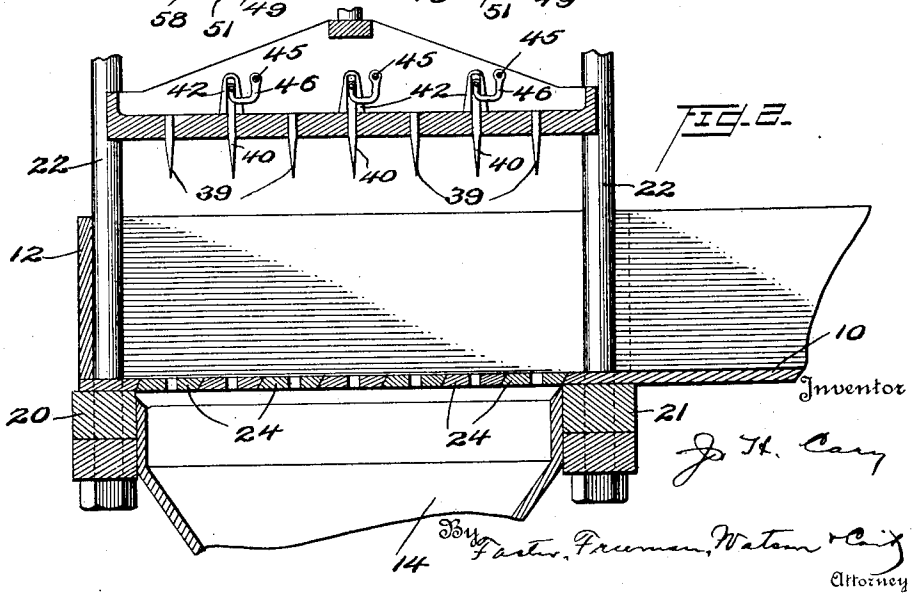


FIG. 2.



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3 SHEETS—SHEET 3.

FIG. 5.

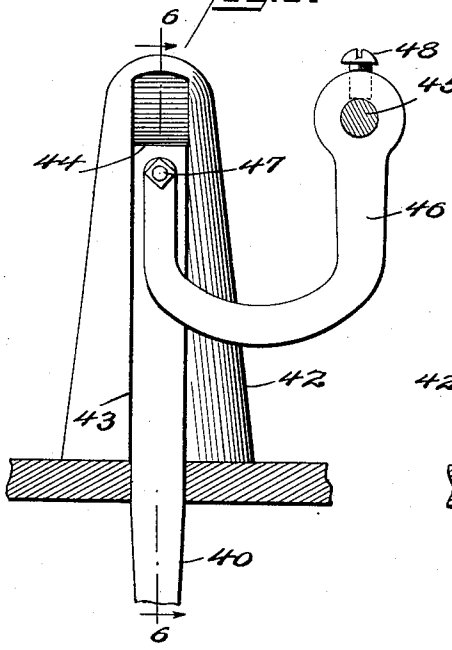


FIG. 6.

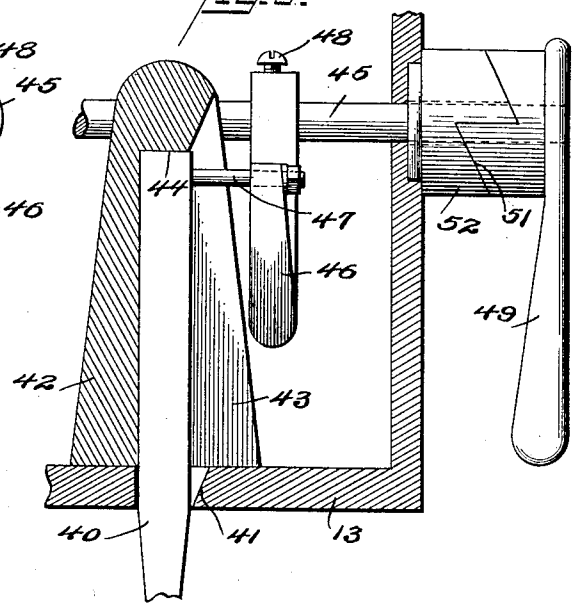


FIG. 7.

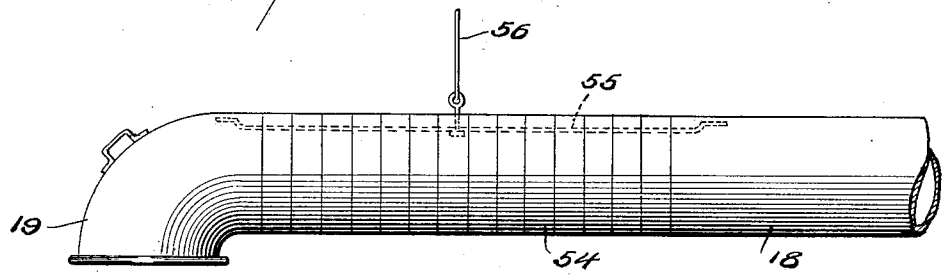
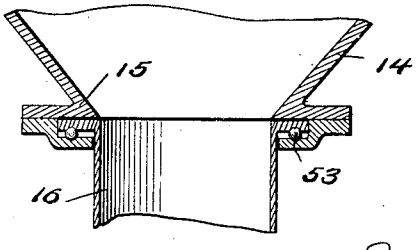


FIG. 8.



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UNITED STATES PATENT OFFICE.

JESSE H. CARY, OF VALDOSTA, GEORGIA.

ICE CRUSHING AND CONVEYING MECHANISM.

1,386,315. Specification of Letters Patent. Patented Aug. 2, 1921.

Application filed November 8, 1919. Serial No. 336,619.

To all whom it may concern:

Be it known that I, JESSE H. CARY, a citizen of the United States, and residing at Valdosta, Lowndes county, State of Georgia, have invented certain new and useful Improvements in Ice Crushing and Conveying Mechanism, of which the following is a specification.

This invention relates to ice crushing and conveying mechanism and was specially designed for use in re-icing refrigerator cars. It is designed to save time, expense and labor in handling ice from the time that it leaves the icehouse or other place of supply in block form, until it is made to enter the proper compartments of the refrigerator cars in crushed form. It saves expense and labor, since three men only are necessary in its use, one of them being to place the blocks of ice from the icehouse or other source of supply upon a chute leading to the crushing mechanism itself, one to control the operation of the crushing mechanism, and the third to see that the end of the discharge chute or pipe for crushed ice is in proper position to make it enter the proper compartment of the refrigerator car. The discharge pipe is flexible and extensible so that it may be easily and quickly brought into position to supply the particular car desired. The crushing and conveying may be very rapid and in fact, almost continuous. The novel features of the invention will be apparent from the following description taken in connection with the drawings.

In the drawings,

Figure 1 is a side view of the crushing device with a part of the inlet and outlet chutes;

Fig. 2 is a longitudinal section through the crushing receptacle and crushing block showing a portion of the inlet and discharge chutes;

Fig. 3 is a view looking down into the crushing receptacle;

Fig. 4 is a top view of the crushing block;

Fig. 5 is an enlarged detail view of one of the removable spikes in the crushing block and its operating means;

Fig. 6 is a vertical section on the line 6—6 of Fig. 5;

Fig. 7 is a side view of the end portion of the flexible conveyer for the crushed ice; and

Fig. 8 is a section through the rotating joint connection between the chute and conveyer.

Considering first the broad features and arrangement of my machine, it includes a chute 10 which may be in the form of a trough open at the top and of such size as to receive ordinary blocks of ice leading from a source of supply such as an icehouse downwardly at a slight angle to the crushing machine. The chute 10 leads to the open end of a crushing box or receptacle 11, which has a normally closed bottom and upright sides and an end wall 12, and which is of the general shape and slightly larger than an ordinary block of ice. There is a crushing block 13 mounted above the receptacle 11 of such shape and size as to enter that receptacle from the top and crush or split up a block of ice in it, the crushing block being provided with means for reciprocating it vertically for the purpose. Below the crushing receptacle 10 there is a fixed chute 14 which is inclined or tapered down to a point where there is a circular discharge opening 15, this chute being adapted to receive crushed ice dumped from the crushing receptacle as hereinafter described. A tubular conveyer 16 has one end secured to said chute 14 around said discharge opening 15 by a rotary ball bearing connection so as to receive the crushed ice passing through said opening, and said conveyer is bent at 17 to somewhat less than a right angle leaving the part 18 extending at a sufficient angle downward to cause the crushed ice to travel down it by gravity. The tubular conveyer is so formed as to be extensible longitudinally and flexible transversely so that its downwardly curved discharge end 19 (see Fig. 7) may be carried to and made to enter a top opening in the refrigerator car or other place to be supplied with crushed ice.

It will be understood that the crushing device shown in Fig. 1 will be mounted on any suitable support and at the proper elevation to supply the crushed ice to the refrigerator cars by gravity through the conveyer 18 and, therefore, it has not seemed necessary to specifically show such support. The crushing device includes a main frame embodying horizontal side sections 20, 21 at the bottom connected by corner rods 22 to the top frame 23 which is rigid and strong and of any suitable form. The

chute 14 is supported from the sections 20 and 21 and the end of the inlet chute 10 is supported on 21.

The bottom of the receptacle 11 is made up of parallel sections 24 having similarly beveled edges fitting close against each other to form a level floor. Each section 24 has at its ends central pivot extensions 25, 26 passing through and having rotary bearing in the side walls of receptacle 11. An arm 27 is secured to the end of each pivot bearing 26 outside of the receptacle and these arms are connected by the operating bar 28. The bar 28 is pivotally connected at its end 29 to the hand lever 30 which in turn is pivoted at 31 on a bracket 32. It will be seen from this construction that a pull to the left in Fig. 1 on hand lever 30 will turn the sections 24 from their flat or horizontal position to one on edge, thus in effect opening the bottom of the receptacle and dumping the crushed ice into the chute 14. The hand lever 30 moves along a toothed segment 33 and a hand operated spring catch 34 carried by the lever 30 enters the notches in the segment to lock the lever in position, thus securely holding the sections 24 in the desired position.

The crushing block 13 is preferably moved up and down by steam or air pressure in the cylinder 35, the operation being controlled by the hand lever 36 regulating the supply of steam or air and the crushing block being secured to the lower end of the reciprocating piston rod 37. The connections between the rod 37 and the crushing block 13 is preferably through a cross bar 38 extending from the top of one side wall of the crushing block to the other. The crushing block at its corners fits the vertical rods 22 and this furnishes means for guiding it in its vertical reciprocations. The crushing block 13 has extending through it and projecting from its under surface a series of rows of spikes 39 fixedly secured in position. There is also a series of rows of removable spikes 40 extending through the crushing block, these rows of removable spikes or picks being between the rows of fixed spikes. The removable spikes 40 pass through holes in the crushing block 13 which are enlarged at one side on an angle, as shown at 41 (Fig. 6) so that the spikes can be tilted for removal. Cast metal cores 42 are secured on the upper face of crushing block 13 and are provided with lateral slots 43 having a top wall or shoulder 44 to receive the spikes 40, the top wall or shoulder 44 serving to prevent the spikes from being forced upwardly when their points strike the ice to be split. All of the removable spikes in a single row may be removed at one time and at one operation by the mechanism shown partly in Figs. 5 and 6. For this purpose there is a rotary rod 45 extending across the top of the block having secured thereto at intervals the curved arms 46 which in turn are pivotally connected to the upper ends of removable spikes 40 by bolts 47. The arms 46 may be secured in place by set screws 48. The rod 45 has at one end an operating handle 49 (see Fig. 6) and at the other end a coiled spring 50 tending to pull the rod to the left in Fig. 6 and up in Fig. 4 to keep the spikes 40 in proper operative position in the cores 42. The rod 45 also has secured to it a member having beveled teeth 51 engaging similar teeth carried by the side walls of block 13 and serving to lock the spikes 40 against upward movement. To raise the removable spikes, the rod 45 is pulled to the right in Fig. 6 carrying the upper end of spikes 40 beyond shoulder 44 and then it is turned raising those spikes. The purpose of having removable spikes is to regulate the size of the pieces of ice due to the crushing action. The sections 24 have in them a series of openings 57 corresponding in position and size to the points of the spikes 39 and 40 so that when the crushing block is lowered to pass the spikes through the ice, the spikes will not strike the bottom of the crushing receptacle, but will enter the openings 57.

The ball bearing connection 53 between the bottom of chute 14 and the end of the conveyer 16 provides for easy turning. A section of the tubular conveyer 18 is so formed as to make it flexible and extensible, as indicated diagrammatically at 54. The present invention does not reside in the specific structure of the flexible and extensible feature, and it will be understood that any known structure for the purpose may be used. A brace 55 may be secured in place when the conveyer has been properly adjusted, and it may be secured to any suitable support by a cord or chain 56.

The handles 49 for operating the rods 45 and elevating the removable spikes 40 may be connected together as by the rods 58 whereby they may be moved endwise and turned at one time raising all of the removable spikes at once, as illustrated in Fig. 1. Instead of having a single valve mechanism controlled by the single hand lever 36 to regulate and control the supply of compressed air or steam to the cylinder above or below the piston to move the crushing block down or up, I may so arrange the valve operated by lever 36 that it will merely control the supply of air or steam and may use another valve operated by hand lever 59 to control the direction of the supply above or below the piston.

Having thus described the invention what is claimed as new and desired to be secured by Letters Patent is:

1. In a device of the class described for crushing and delivering ice the combination with a receptacle open at one end adapted

to receive and hold a block of ice, the bottom of said receptacle being made up of a series of parallel sections pivoted at their ends and adapted to be turned edgewise to open the bottom, a chute for conveying blocks of ice into said receptacle through its open end, a crushing block having downwardly projecting spikes adapted to enter said receptacle from the top and split or break said block of ice, a flexible and adjustable conveying chute or pipe for the crushed ice and means for turning said sections on their pivots to dump the ice into said chute.

2. In a device of the class described for crushing and delivering ice the combination with a receptacle open at one end adapted to receive and hold a block of ice, the bottom of said receptacle being made up of a series of parallel sections pivoted at their ends and adapted to be turned edgewise to open the bottom and each having a row of small holes therethrough, a chute for conveying blocks of ice into said receptacles through its open end, a crushing block having downwardly projecting spikes adapted to split said block of ice and enter partway said small holes in said bottom, means for turning said sections on edge to dump the ice, a chute for receiving the dumped ice and a pipe leading at an incline downward from the bottom of said chute.

3. In a device of the class described a receptacle adapted to receive and hold a block of ice to be crushed having a bottom made up of parallel sections pivoted at their ends to turn edgewise and provided with small holes therethrough a crushing block adapted to reciprocate from above up and down in said receptacle and provided with spikes corresponding to and adapted to enter said holes, a chute below said receptacle to receive crushed ice, and means for turning said sections to dump the ice.

4. In a device of the class described a receptacle adapted to receive and hold a block of ice to be crushed having a bottom made up of parallel sections pivoted at their ends to turn edgewise and provided with small holes therethrough, a crushing block adapted to reciprocate from above up and down in said receptacle and provided with spikes corresponding to and adapted to enter said holes, manually operated means for withdrawing some of said spikes upwardly through the crushing block rendering them inoperative, a chute below said receptacle to receive crushed ice and means for turning said sections to dump the ice.

5. In a device of the class described a receptacle adapted to hold a block of ice to be crushed, a crushing block having a series of fixed spikes projecting from its working face adapted to enter and break up said block of ice and a series of removable spikes extending through said block and projecting from said working face, lever mechanism for raising said removable spikes through said block out of operative position, and means for reciprocating said crushing block toward and away from said block of ice in said receptacle.

6. In a device of the class described a receptacle adapted to hold a block of ice to be crushed, a crushing block having a series of fixed spikes projecting from its working face adapted to enter and break up said block of ice and a series of removable spikes extending through said block and projecting from said working face, cast metal cores on said block having side slots with shoulders at the top to receive and hold said removable picks in operative position against end movement, spring pressed lever mechanism adapted on a longitudinal pull to tilt said picks out of line with said shoulders and by a turning movement to raise them out of operative position and means for reciprocating said crushing block toward and away from said block of ice in said receptacle.

7. In a device of the class described a receptacle adapted to receive and hold a block of ice to be crushed having a bottom made up of parallel sections having similarly beveled margins adapted to make contact and produce a complete closure, the said sections being provided with central end pivots permitting them to turn up on edge to open the bottom, means for crushing a block of ice in said receptacle, and means for turning said sections to dump the crushed ice.

8. In a device of the class described a receptacle adapted to receive and hold a block of ice to be crushed having a bottom made up of parallel sections having similarly beveled margins adapted to make contact and produce a complete closure, the said sections being provided with central end pivots permitting them to turn up on edge to open the bottom, means for crushing a block of ice in said receptacle, and means for turning said sections to dump the crushed ice comprising end levers for each section, a connecting rod between said levers and a hand lever for moving said connecting rod longitudinally.

In testimony whereof I affix my signature.

JESSE H. CARY.